Chapter : 8. LINEAR EQUATIONS IN TWO VARIABLES

Exercise : 8A

Question: 1

(i) The given equation is x = 5

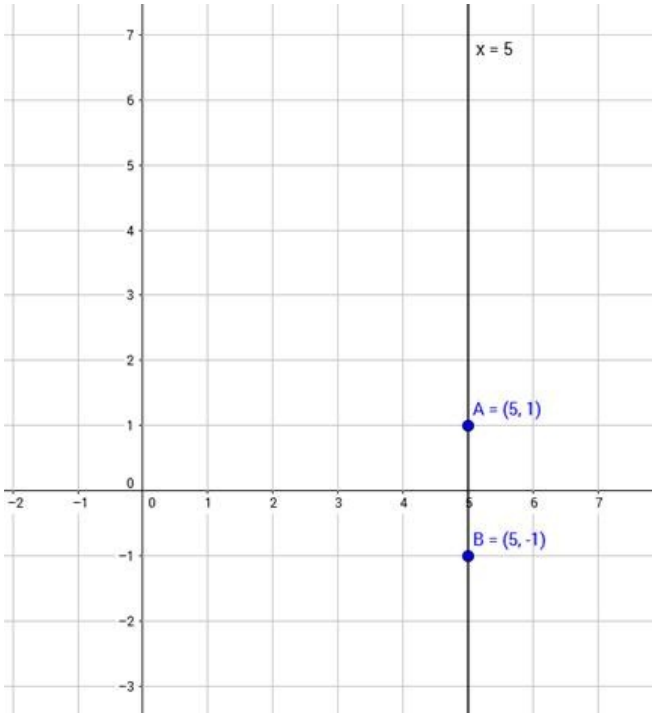
A line requires minimum of two points to be plot.

Thus we get the following table:

x	5	5
y	1	-1

Plot points A (5,1) and B (5,-1) on the graph paper.

Join AB.



The line AB is the required graph.

(ii) The given equation is y = -2

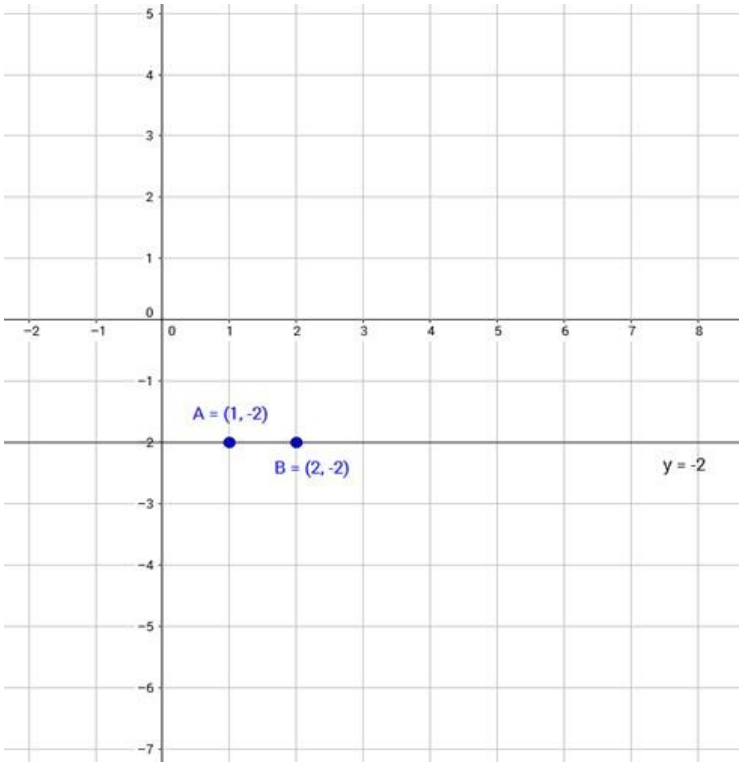
A line requires minimum of two points to be plot.

Thus we get the following table:

x	1	2
y	-2	-2

Plot points A(1,-2) and B(2,-2) on the graph paper.

Join AB.



The line AB is the required graph

(iii) The given equation is x + 6 = 0, which means x = -6

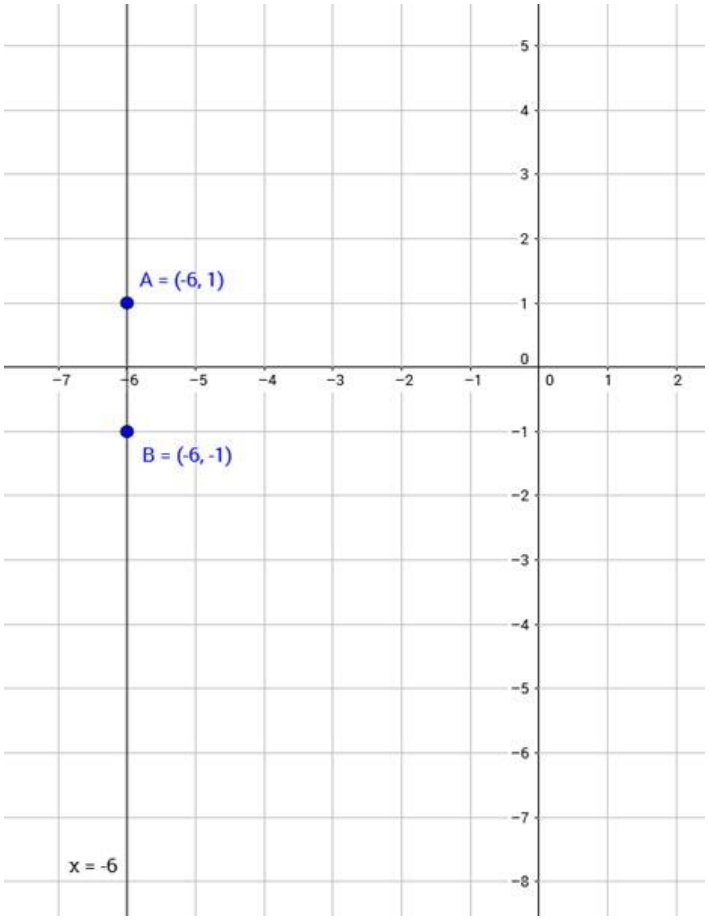
A line requires minimum of two points to be plot.

Thus we get the following table:

x	-6	-6
y	1	-1

Plot points A (-6,1) and B (-6,-1) on the graph paper.

Join AB.



The line AB is the required graph

(iv) The given equation is x + 7 = 0, which means x = -7

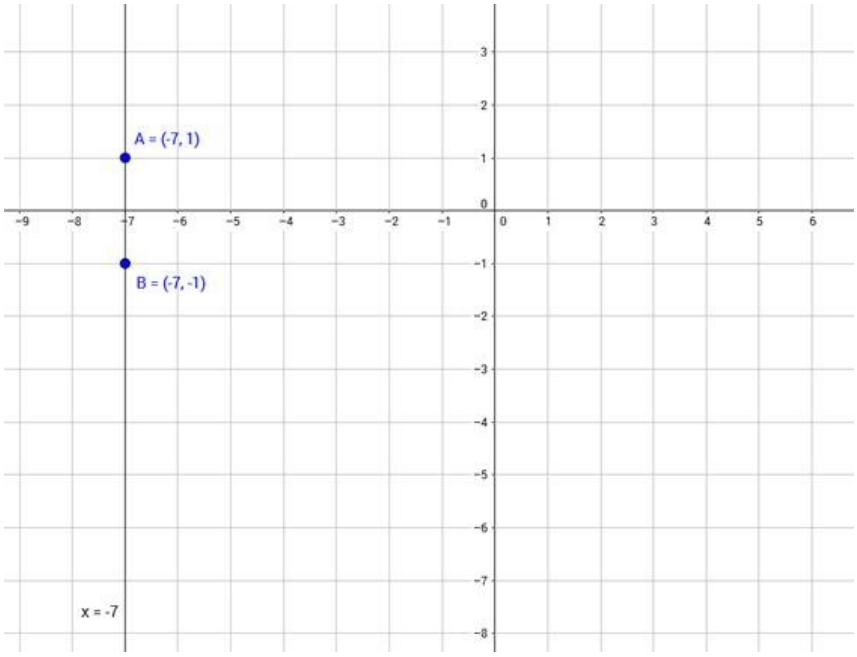
A line requires minimum of two points to be plot.

Thus we get the following table:

x	-7	-7
y	1	-1

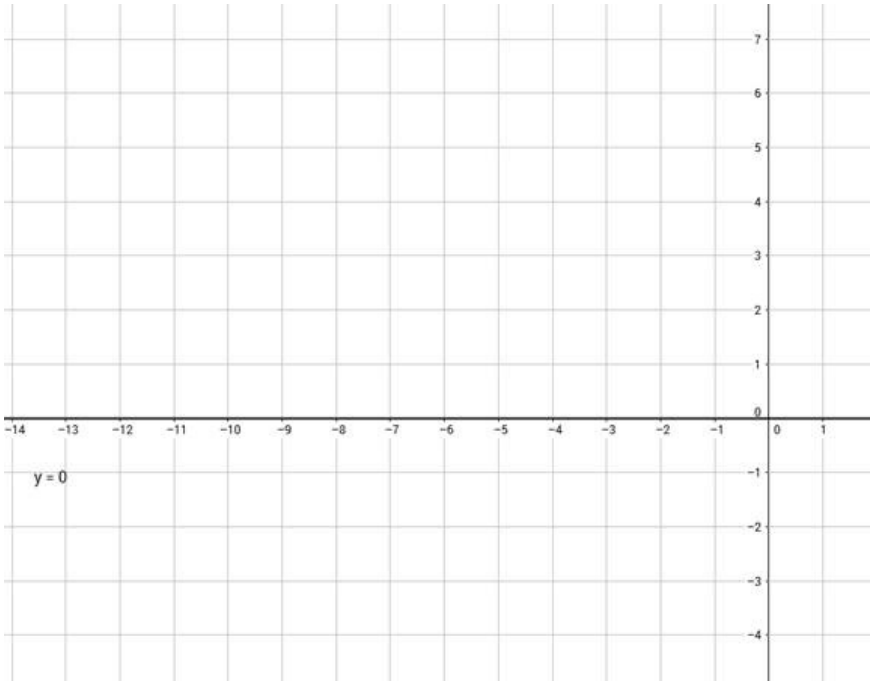
Plot points A (-7,1) and B (-7,-1) on the graph paper.

Join AB.

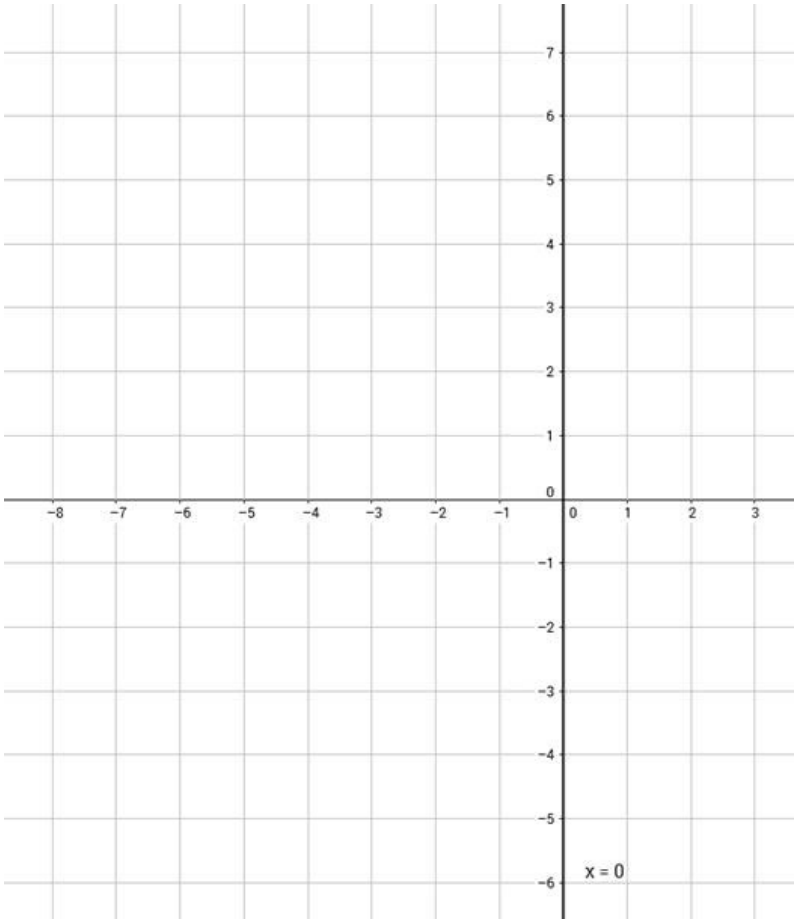


The line AB is the required graph

(v) Y =0 represents the x – axis



(vi) x = 0 represents y – axis



Question: 2

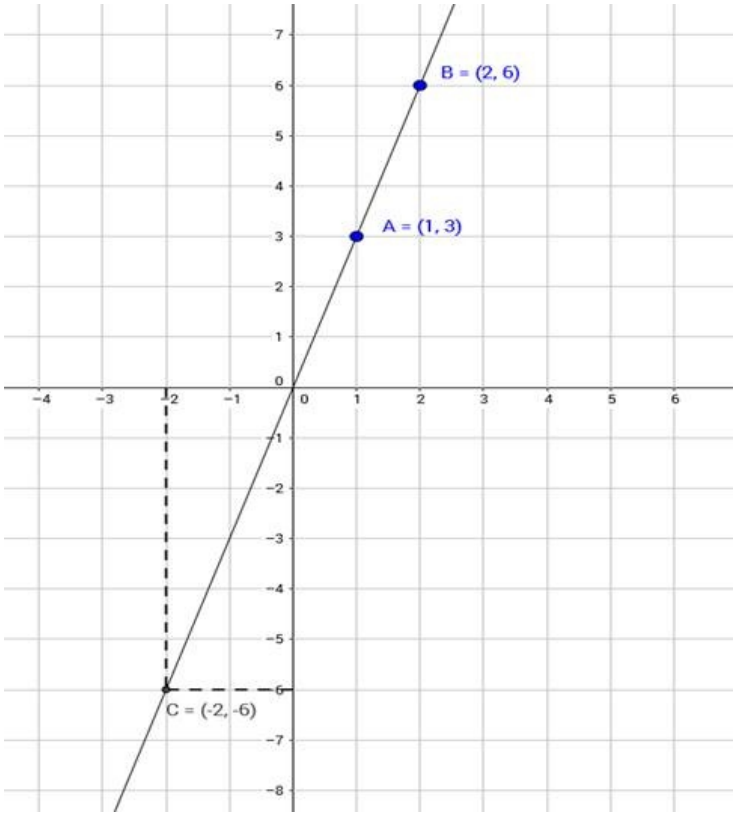
The given equation is y = 3x.

Now we find minimum two points to plot given line, y = 3x

Thus, we have the following table:

x	1	2
y	3	6

Plot points A (1,3) and B (2,6) on a graph paper and join them to get the required graph.



Locate X = -2 from origin. Then follow the graph grid in downward direction from the point (-2, 0) where it meets the line y=3x.

We get our required point as shown in the above graph, ie C(-2, -6)

Hence, our value of y = -6

Question: 3

The given equation is,

x + 2y - 3 = 0

⇒ x = 3 - 2y

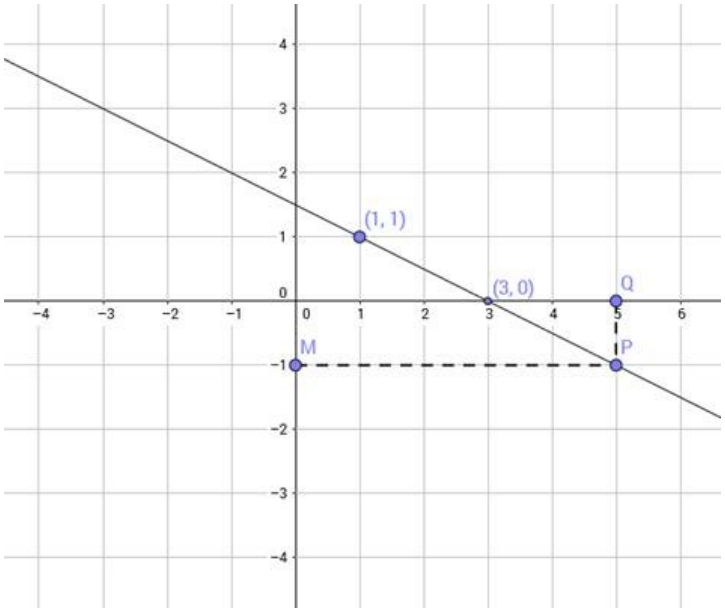
Putting y = 1, x = 3 - (2 × 1) = 1

Putting y = 0, x = 3 - (2 × 0) = 3

Thus, we have the following table:

x	1	3
y	1	0

Plot points (1,1) and (3,0) on a graph paper and join them to get the required graph.



Take a point Q on x-axis such that OQ = 5.

Draw QP parallel to y-axis meeting the line (x = 3 - 2y) at P.

Through P, draw PM parallel to x-axis cutting y-axis at M.

So, y = OM = -1.

Question: 4

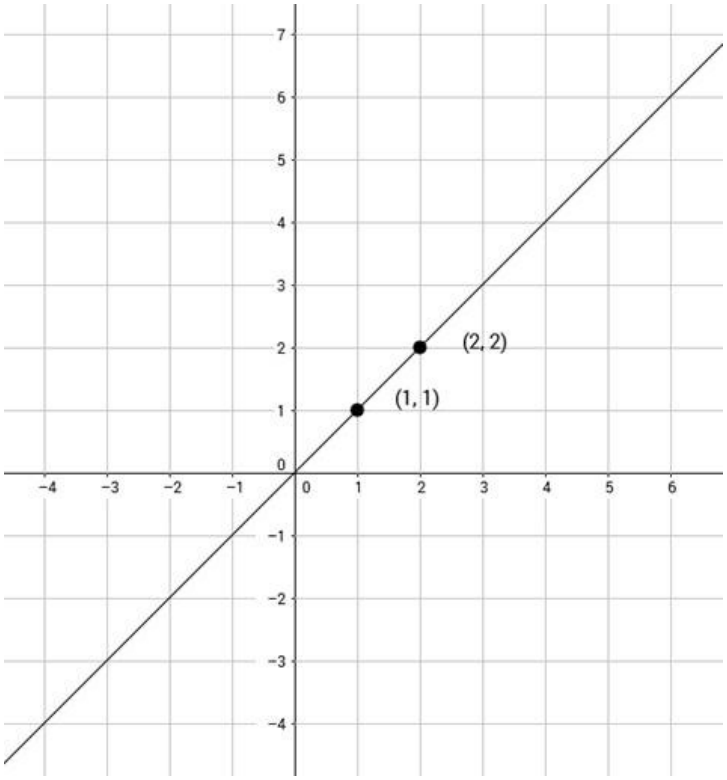
(i) The given equation is y = x

Let x = 1, then y = 1 and let x = 2, then y = 2

Thus, we have the following table:

x	1	2
y	1	2

Plot points (1,1) and (2,2) on a graph paper and join them to get the required graph.



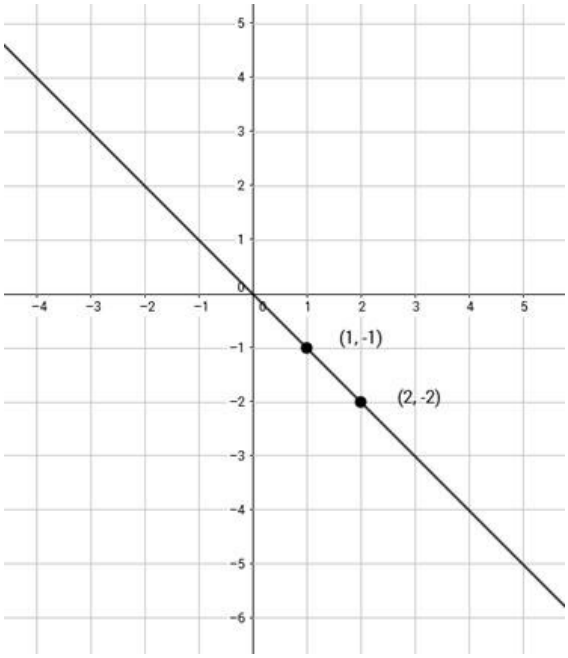
(ii) The given equation is y = -x

Now, if x = 1, y = -1 and if x = 2, y = -2

Thus, we have the following table:

x	1	2
y	-1	-2

Plot points (1,-1) and (2,-2) on a graph paper and join them to get the required graph.



(iii) The given equation is y + 3x = 0

⇒ y = -3x

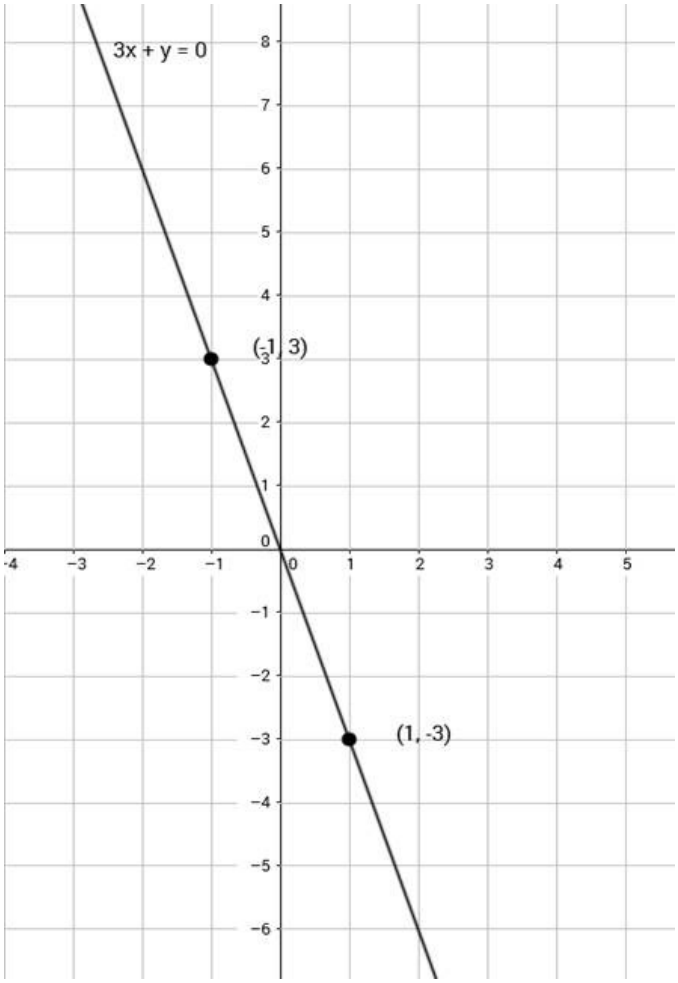
Now, if x = -1, then y = -3 × (-1) = 3

And, if x = 1, then y = -3 × 1 = -3

Thus we have the following table:

x	1	-1
y	-3	3

Plot points (1,-3) and (-1,3) on a graph paper and join them to get the required graph.



(iv) The given equation is 2x + 3y = 0

$y = \frac{-2}{3} x$

Now, if x = 3, then

$y = \frac{-2}{3} \times 3 = -2$

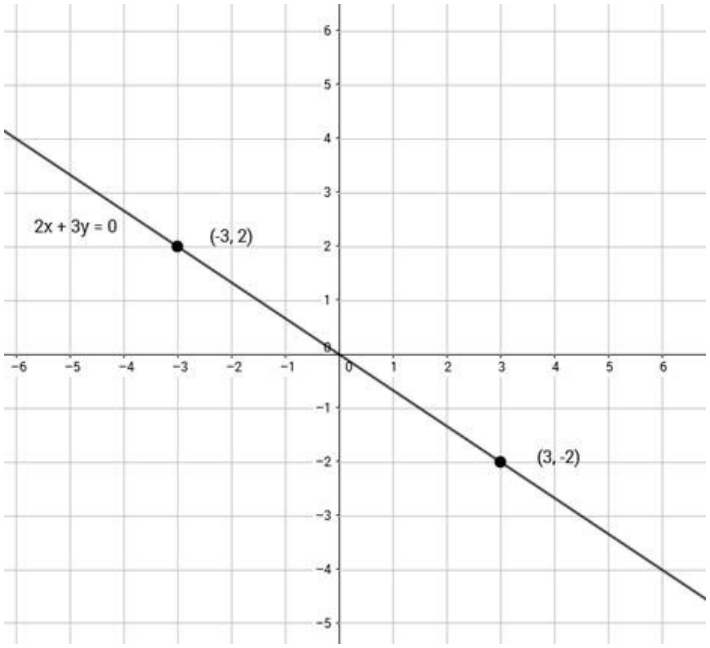
And, if x = -3, then

$y = \frac{-2}{3} \times (-3) = 2$

Thus, we have the following table

x	3	-3
y	-2	2

Plot points (3,-2) and (-3,2) on a graph paper and join them to get the required graph.



(v) The given equation is 3x - 2y = 0

$y = \frac{3}{2} x$

Now, if x = 2,

$y = \frac{3}{2} \times 2 = 3$

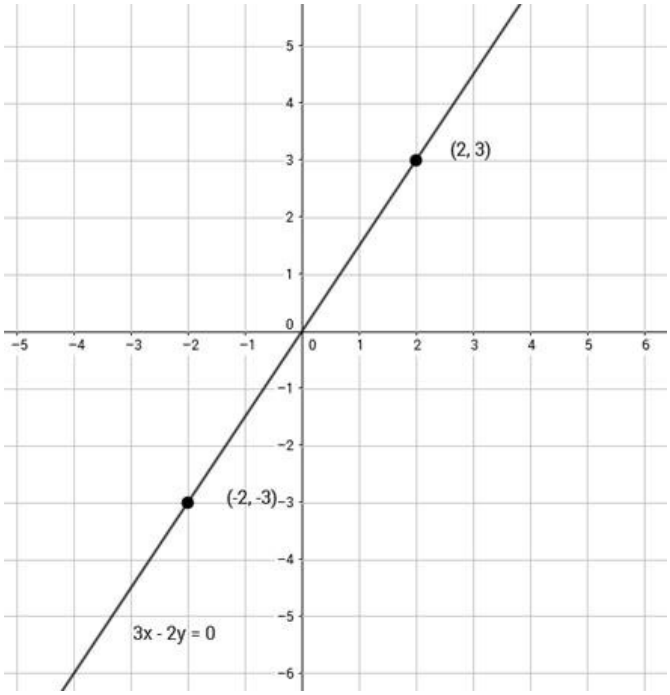
And, if x = -2,

$y = \frac{3}{2} \times (-2) = -3$

Thus, we have the following table:

x	2	-2
y	3	-3

Plot points (2,3) and (-2,-3) on a graph paper and join them to get the required graph.



(vi) The given equation is 2x + y = 0

⇒ y = -2x

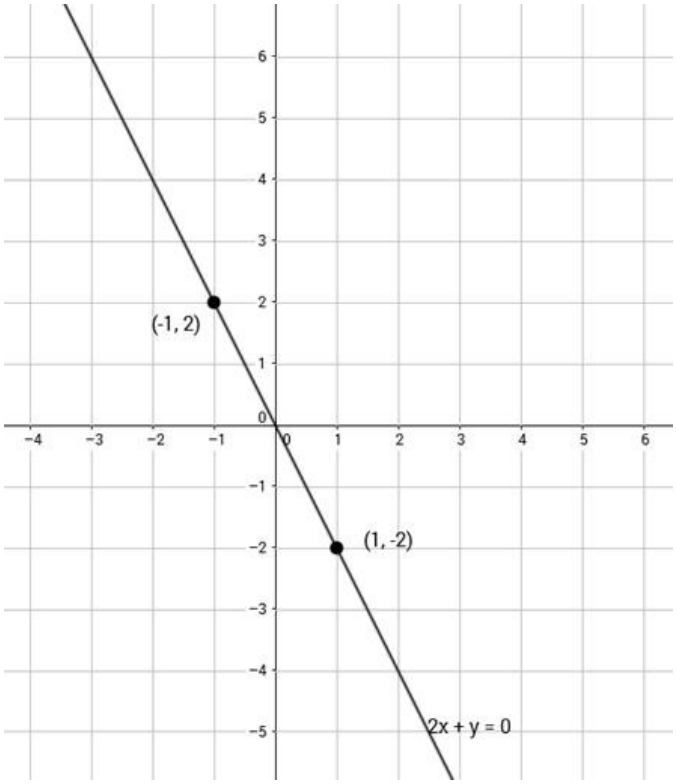
Now, if x = 1, then y = -2 × 1 = -2

And, if x = -1, then y = -2 × (-1) = 2

Thus, we have the following table:

x	1	-1
y	-2	2

Plot points (1,-2) and (-1,2) on a graph paper and join them to get the required graph.



Question: 5

The given equation is, 2x - 3y = 5

$\therefore y = \frac{2x-5}{3}$

Now, if x = 4, then

$y = \frac{2\times4-5}{3} = \frac{8-5}{3} = 1$

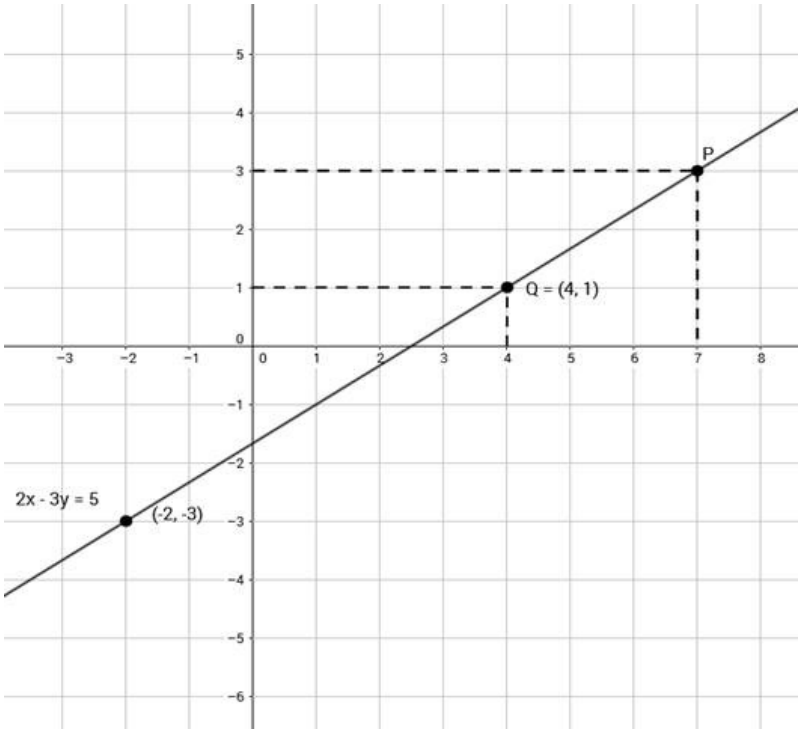
And, if x = -2, then

$y = \frac{2\times(-2)-5}{3} = \frac{-4-5}{3} = -3$

Thus, we have the following table:

x	4	-2
y	1	-3

Plot points (4,1) and (-2,-3) on a graph paper and join them to get the required graph.



(i) When x = 4, draw a line parallel to y-axis at a distance of 4 units from y-axis to its right cutting the line at Q and through Q draw a line parallel to x-axis cutting y-axis which is found to be at a distance of 1 units above x-axis.

Thus, y = 1 when x = 4.

(ii) When y = 3, draw a line parallel to x-axis at a distance of 3 units from x-axis and above it, cutting the line at point P. Through P, draw a line parallel to y-axis meeting x-axis at a point which is found be 7 units to the right of y axis.

Thus, when y = 3, x = 7.

Question: 6

The given equation is 2x + y = 6

$\therefore$ y = 6 - 2x

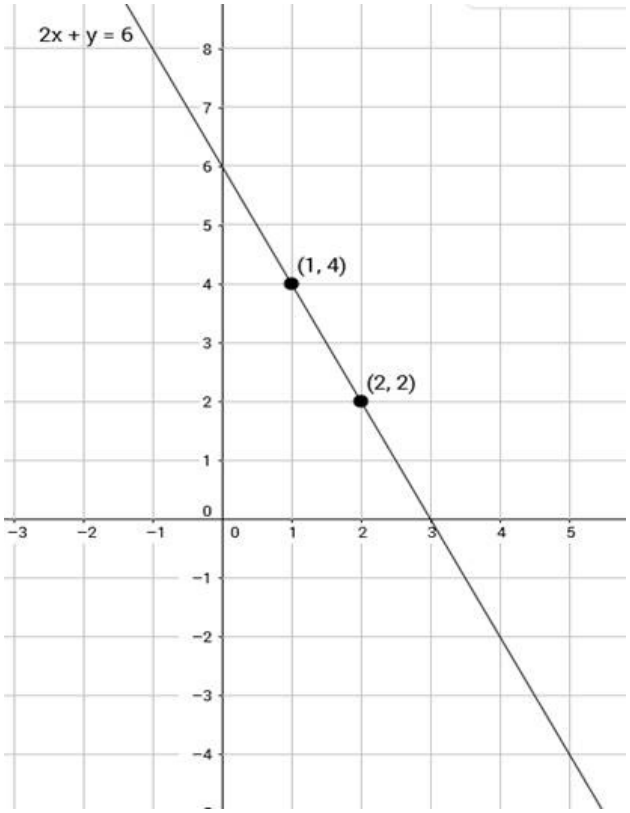
Now, if x = 1, then y = 6 - 2 × 1 = 4

And, if x = 2, then y = 6 - 2 × 2 = 2

Thus, we have the following table:

x	1	2
y	4	2

Plot points (1,4) and (2,2) on a graph paper and join them to get the required graph.



We find that the line cuts the x-axis at a point P which is at a distance of 3 units to the right of y-axis.

So, the co-ordinates of P are (3,0).

Question: 7

The given equation is 3x + 2y = 6

2y = 6 - 3x

$\therefore y = \frac{6-3x}{2}$

Now, if x = 2, then

$y = \frac{6-3\times2}{2} = 0$

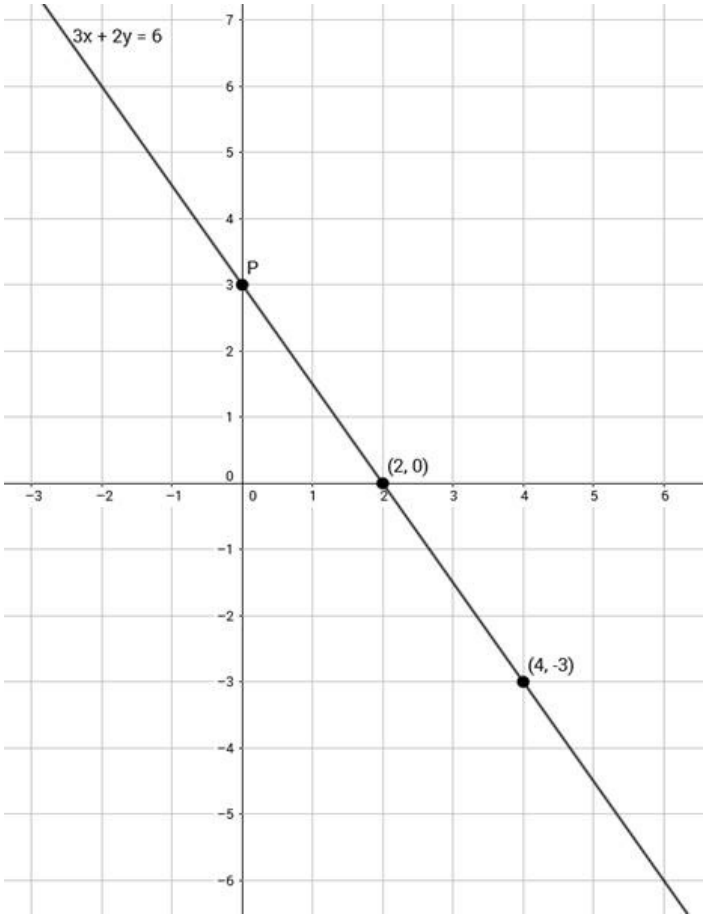
And, if x = 4, then

$y = \frac{6-3\times4}{2} = -3$

Thus, we have the following table:

x	2	4
y	0	-3

Plot points (2, 0) and (4,-3) on a graph paper and join them to get the required graph.



We find that the line 3x + 2y = 6 cuts the y-axis at a point P which is 3 units above the x-axis.

So, co-ordinates of P are (0,3).

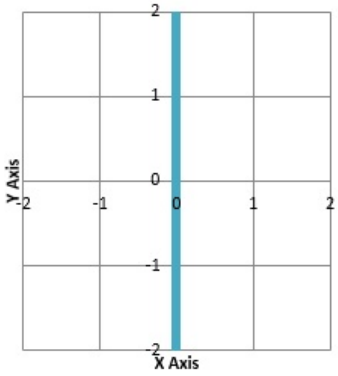
Exercise : CCE QUESTIONS

Question: 1

x = 0 is the equa

Solution:

Here, x = 0 is the equation of y-axis. Since, if we plot, x = 0 all the points will lie on y-axis irrespective of the value of y.



The blue line in the figure is the plotting of X = 0

which is also y-axis.

Question: 2

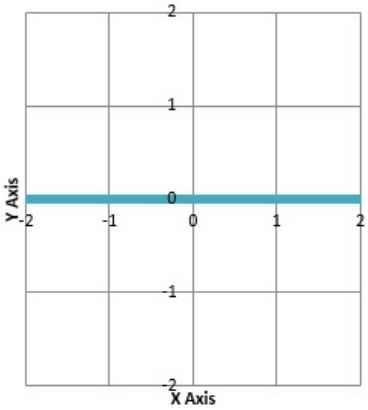
y = 0 is the ques

Solution:

y = 0 is the equation of x-axis. Since, if we plot,

y = 0 all the points will lie on x-axis irrespective

of the value of x.



The blue line in the figure is the plotting of

y = 0 which is also x-axis.

Question: 3

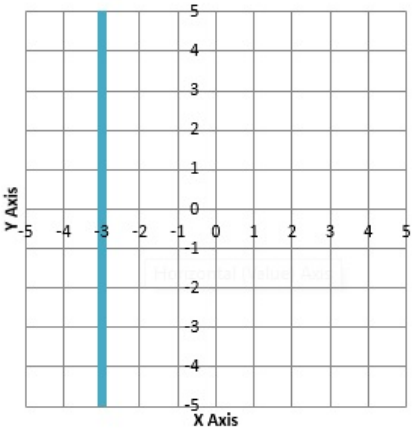
x + 3 = 0 is the

Solution:

x + 3 = 0

⇒ x = 0 – 3

⇒ x = – 3



Therefore, the value of x co – ordinate will be – 3. Hence, the line will pass through (– 3,0).

Since, the value of x = – 3 therefore, it will pass through all values of y while x will remain constant. Hence, the line will be parallel to y-axis.

Question: 4

y – 4 = 0 is the

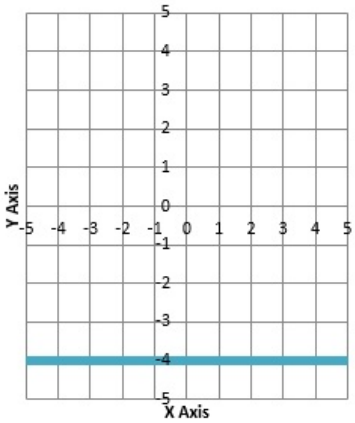
Solution:

y – 4 = 0

⇒ y = 0 + 4

⇒ y = 0

Therefore, the value of y co – ordinate will be 4. Hence, the line will pass through (0,4) .



Since, the value of $y = 4$ therefore, it will pass through all values of x while y will remain constant. Hence, the line will be parallel to x-axis.

Question: 5

The point of the

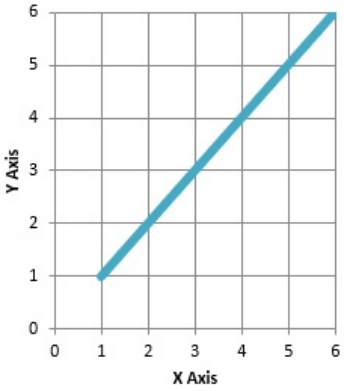
Solution:

When a = 1 then we get the point (1,1)

When a = 2 then we get the point (2,2)

When a = 3 then we get the point (3,3)

And so on



On plotting these points on the graph we will get the equation of line y = x.

Question: 6

The point of the

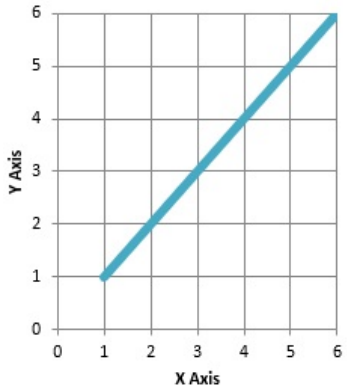
Solution:

When a = 1 then we get the point (1,1)

When a = 2 then we get the point (2,2)

When a = 3 then we get the point (3,3)

And so on



On plotting these points on the graph we will get the equation of line y = x

⇒ y – x = 0

Question: 7

The linear equati

Solution:

3x – 5y = 15

⇒ 3x = 15 + 5y

$\Rightarrow x = \frac{15+5y}{3}$

When y = – 6, then $x = \frac{15+5(-6)}{3}$

$\Rightarrow x = \frac{15-30}{3}$

$\Rightarrow x = -\frac{15}{3}$

$\Rightarrow x = -5$

When y = 0, then $x = \frac{15+5(0)}{3}$

$\Rightarrow x = \frac{15+0}{3}$

$\Rightarrow x = \frac{15}{3}$

⇒ x = 5

When y = 6, then,

$\Rightarrow x = \frac{15+5(6)}{3}$

$\Rightarrow x = \frac{15+30}{3}$

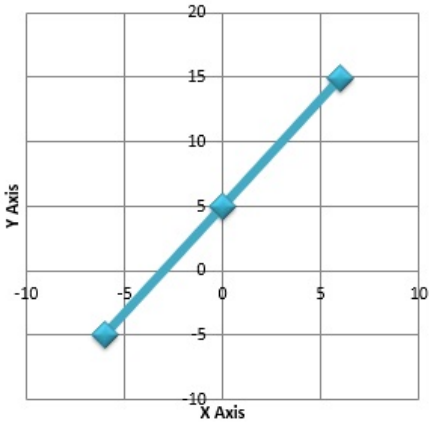
$\Rightarrow x = \frac{45}{3}$

⇒ x = 15

Thus, we have the following table,

X	– 6	0	6
Y	– 5	5	15

Plotting these points we have the following graph,



The blue line in the graph is the required line of the equation, 3x – 5y = 15

According to the graph, the equation satisfies many points therefore, it has infinitely many solutions.

Question: 8

The graph of the

Solution:

3x + 2y = 6

⇒ 2y = 6 – 3x

$\Rightarrow y = \frac{6-3x}{2}$

When x = 0, then,

$\Rightarrow y = \frac{6-3(0)}{2}$

$\Rightarrow y = \frac{6-0}{2}$

$\Rightarrow y = \frac{6}{2}$

$\Rightarrow y = 3$

When x = 2, then,

$\Rightarrow y = \frac{6-3(2)}{2}$

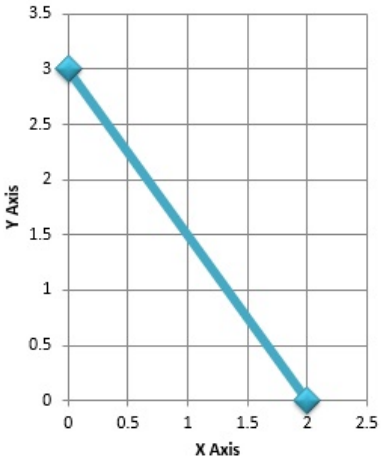
$\Rightarrow y = \frac{6-6}{0}$

⇒ y = 0

Thus, we have the following table,

X	0	2
Y	3	0

Plotting these points we have the following graph,



The blue line in the graph is the required line of the equation, 3x + 2y = 6

According to the graph, the equation,

3x + 2y = 6 cuts the y-axis at the point (0, 3)

Question: 9

The graph of the

Solution:

4x + 3y = 12

⇒ 3y = 12 – 4x

$\Rightarrow y = \frac{12-4x}{3}$

When x = 0, then,

$\Rightarrow y = \frac{12-4(0)}{3}$

$\Rightarrow y = \frac{12-0}{3}$

$\Rightarrow y = \frac{12}{3}$

$\Rightarrow y = 4$

When x = 3, then,

$\Rightarrow y = \frac{12-4(3)}{4}$

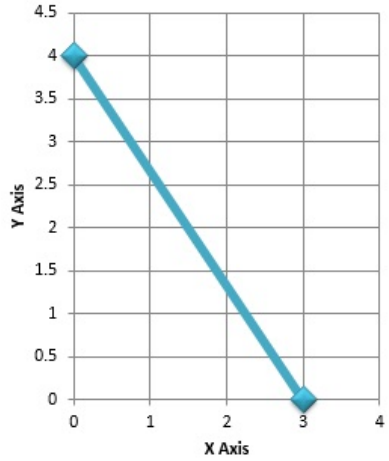
$\Rightarrow y = \frac{12-12}{0}$

⇒ y = 0

Thus, we have the following table,

X	0	3
Y	4	0

Plotting these points we have the following graph,



The blue line in the graph is the required line of the equation, 4x + 3y = 12

According to the graph, the equation,

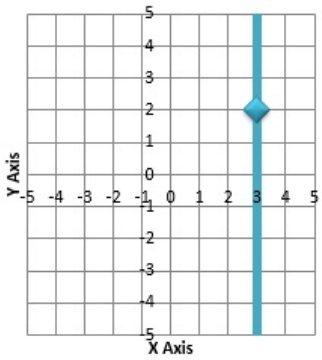
4x + 3y = 12 cuts the x-axis at the point (3, 0)

Question: 10

The graph of the

Solution:

The graph of the line x = 3 is,



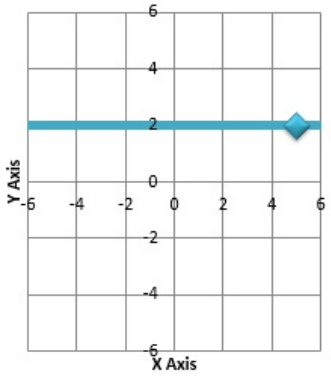
Clearly from the graph, it passes through (3,2)

Question: 11

The graph of the

Solution:

The graph of the line y = 2 is,



Clearly from the graph, it passes through (5,2)

Question: 12

The graph of the

Solution:

Out of all given four points, only (d) point has y coordinate= 2

Therefore, the line y = – 3 cannot pass through the point (– 3, 2)

Question: 13

A linear equation

Solution:

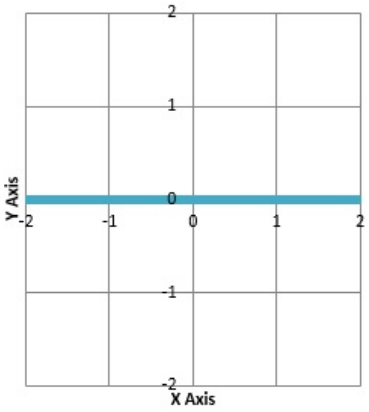
An equation of the form ax + by + c = 0, where a, b and c are real numbers such that a ≠ 0 and b ≠ 0, is called a linear equation in two variables

Question: 14

Any point on x-ax

Solution:

Any point on x-axis will be of the form (x, 0) where $x \neq 0$ except origin which is (0, 0).



Since, the equation of x-axis is y = 0 therefore all the co – ordinates of y will be 0.

Eg: (– 2, 0), (3, 0), (5, 0)

Question: 15

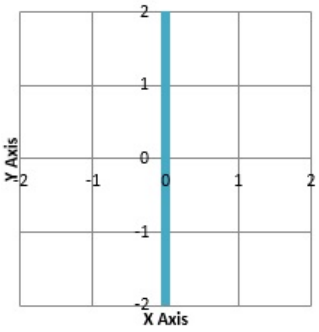
Any point on y-ax

Solution:

Any point on y-axis will be of the form (0, y) where $y \neq 0$ except origin which is (0, 0).

Since, the equation of y-axis is x = 0 therefore all the co – ordinates of x will be 0.

Eg: (0, – 2), (0, 3), (0, 5)



Question: 16

How many linear e

Solution:

Let, a = – 1 and b = – 2 then,

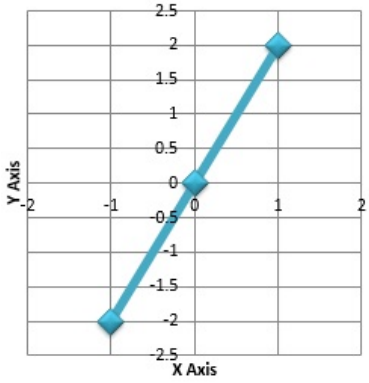
ax + by = c

⇒ (– 1) ×2 + (– 2) ×3 = – 8

Let, a = 0 and b = 0 then,

ax + by = c

⇒ 0×2 + 0×3 = 0



Let, a = 1 and b = 2 then,

ax + by = c

⇒ 1 × 2 + 2 3 = 8

a	b	c
– 1	– 2	– 8
0	0	0
1	2	8

Since, there can be many solutions for 2a + 3b = c, where a, b and c are constants.

Therefore, there can be infinitely many linear equations in x and y that can be satisfied by x = 2, y = 3

Question: 17

The graph of the

Solution:

3x + 2y = 6

⇒ 2y = 6 – 3x

$\Rightarrow y = \frac{6-3x}{2}$

Let x = 0 then,

$y = \frac{6-3x}{2}$

$\Rightarrow y = \frac{6-3\times0}{2}$

$\Rightarrow y = \frac{6}{2}$

$\Rightarrow y = 3$

Let x = 2 then,

$y = \frac{6-3x}{2}$

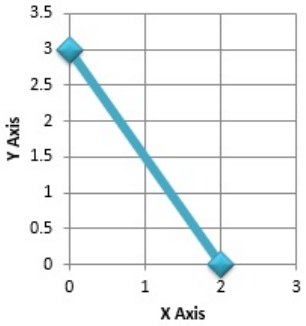
$y = \frac{6-3\times2}{2}$

$y = \frac{6-6}{2}$

$y = 0$

X	0	2
Y	3	0

The blue line is the graph of equation 3x + 2y = 6 which cuts the X – axis at (2, 0)



Question: 18

The graph of the

Solution:

2x + 5y = 10

⇒ 5y = 10 – 2x

$\Rightarrow y = \frac{10-2x}{5}$

Let x = 0 then,

$\Rightarrow y = \frac{10-2\times0}{5}$

$\Rightarrow y = \frac{10-0}{5}$

$\Rightarrow y = \frac{10}{5}$

$\Rightarrow y = 2$

Let x = 5 then,

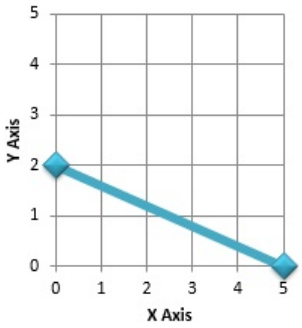
$\Rightarrow y = \frac{10-2\times5}{5}$

$\Rightarrow y = \frac{10-10}{5}$

$\Rightarrow y = 0$

X	0	5
Y	2	0

The blue line is the graph of equation 2x + 5y = 10 which cuts the Y – axis at (0, 2)



Question: 19

If each of (– 2,

Solution:

We will find the solution by trying all the options.

Let the equation be x – y = 0

For the point (– 2, 2),

x = – 2 and y = 2

then, x – y = – 2 – 2 = – 4

For the point (0, 0),

x = 0 and y = 0

then, x – y = 0 – 0 = 0

For the point (2, – 2),

x = 2 and y = – 2

then, x – y = 2 – (– 2) = 2 + 2 = 4

Since, all the solutions are different therefore, the given points (– 2, 2), (0, 0) and (2, – 2) does not satisfy x – y

Let the equation be x + y = 0

For the point (– 2, 2),

x = – 2 and y = 2

then, x + y = – 2 + 2 = 0

For the point (0, 0),

x = 0 and y = 0

then, x + y = 0 + 0 = 0

For the point (2, – 2),

x = 2 and y = – 2

then, x + y = 2 + (– 2) = 2 – 2 = 0

Since, all the solutions are same therefore, the given points (– 2, 2), (0, 0) and

(2, – 2) satisfies x + y. Hence, the equation is x + y

Question: 20

The graph of the

Solution:

We will find the solution by trying all the options.

Let point be $(\frac{-1}{2},\frac{1}{2})$ i.e., $x = \frac{-1}{2}$ and $y = \frac{1}{2}$

Then, $x - y = \frac{-1}{2} - \frac{1}{2}$

Or x – y = – 1 ≠ 0

Therefore, $(\frac{-1}{2},\frac{1}{2})$ does not satisfy x – y = 0

Let point be $(\frac{3}{2},\frac{-3}{2})$ i.e., $x = \frac{3}{2}$ and $y = \frac{-3}{2}$

Then, $x - y = \frac{3}{2} - \left(\frac{-3}{2}\right)$

Or x – y = = $\frac{3}{2} + \frac{3}{2}$

Or x – y = $\frac{6}{2}$ = 3 ≠ 0

Therefore, $\left(\frac{3}{2},\frac{-3}{2}\right)$ does not satisfy x – y = 0

Let point be $(0,-1)$ i.e., x = 0 and y = – 1

then, x – y = 0 + 1 = 1≠0

Therefore, $(0,-1)$ does not satisfy x – y = 0

Let point be $(1,1)$ i.e., x = 1 and y = 1

then, x – y = 1 – 1 = 0

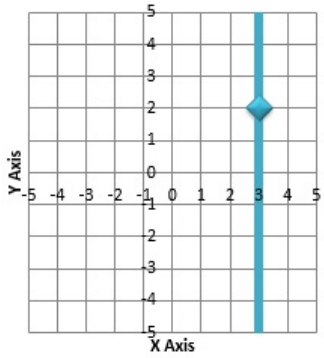
Therefore, $(1,1)$ satisfies x – y = 0

Hence, the graph of the linear equation x – y = 0 passes through the point (1, 1)

Question: 21

We know that the equation of y-axis is x = 0

and the equation of any line parallel to y axis is x = a, therefore, the reason is true.

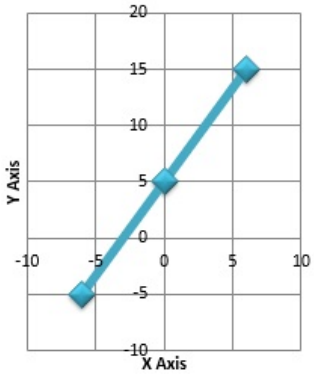


Also, by the reason x = 3 is a line parallel to y-axis, therefore, the assertion is true.

Hence, both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).

Question: 22

We know that the equation of x-axis is y = 0 and the equation of any line parallel to x-axis is y = b, therefore, the reason is true.



For, y = mx

If we put x = 0 then, y = m×0 = 0.

Therefore, we get (0, 0) which is origin.

So, y = mx represents a line passing through the origin, therefore, the assertion is true.

The blue line is the graph of y = mx which clearly, passes through origin.

Hence, both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).

Question: 23

We know that, y = mx is the equation of a line passing through the origin.

Since, For, y = mx

If we put x = 0 then, y = m×0 = 0.

Therefore, we get (0, 0) which is origin.

So, y = mx represents a line passing through the origin, therefore, the reason is true.

Now, if we put x = 0 in the equation x + y = 5 then,

0 + y = 5

⇒ y = 5

Therefore, the point is (0,5) which is not origin.

So, x + y = 5 is not the equation of a line passing through the origin, therefore, the assertion is not true.

Hence, Assertion (A) is false and Reason (R) is true.

Question: 24

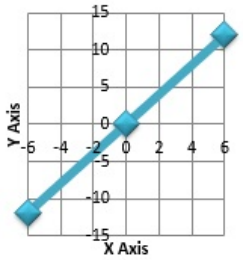
Match the followi

Solution:

Column I	**Column II**
A. The equation of a line parallel to x-axis is	(s) y = k
B. The equation of a line parallel to y-axis is	(r) x = k
C. The equation of a line through the origin is	(p) y = mx
D. If the point (2, 3) lies on the graph of the equation 3y = ax + 4, then a =	(q) $\frac{5}{2}$

A. We know that the equation of x-axis is y = 0 and the equation of any line parallel to x axis is y = k, where k is any constant.

B. We know that the equation of y-axis is x = 0 and the equation of any line parallel to y axis is x = k, where k is any constant.



C. For, y = mx

If we put x = 0 then, y = m×0 = 0 therefore, we get (0, 0) which is origin. So, y = mx represents a line passing through the origin.

The blue line is the graph of y = mx which clearly, passes through origin.

D. Given equation, 3y = ax + 4

⇒ ax = 3y – 4

$\Rightarrow a = \frac{3y-4}{x}$

Point (2,3) i.e. x = 2 and y = 3

$\Rightarrow a = \frac{3\times3-4}{2}$

$\Rightarrow a = \frac{9-4}{2}$

$\Rightarrow a = \frac{5}{2}$

Question: 25

Write each of the

Solution:

(i) x = – 2

⇒ x + 2 = 0

Comparing, x + 2 = 0 with ax + by + c = 0 we get,

the coefficient of x i.e., a = 1

and the coefficient of y i.e., b = 0 since, there is no term of y

and clearly, c = 2

putting the values of a, b and c in ax + by + c = 0 we get,

x + 0×y + 2 = 0

(ii) y = 6

⇒ y – 6 = 0

Comparing, y – 6 = 0 with ax + by + c = 0 we get,

the coefficient of x i.e., a = 0 since, there is no term of x

and the coefficient of y i.e., b = 1

and clearly, c = – 6

putting the values of a, b and c in ax + by + c = 0 we get,

0×x + y – 6 = 0

Question: 26

Write each of the

Solution:

(i) 3x = 5

⇒ 3x – 5 = 0

Comparing, 3x – 5 = 0 with ax + by + c = 0 we get,

the coefficient of x i.e., a = 3

and the coefficient of y i.e., b = 0 since, there is no term of y

and clearly, c = – 5

putting the values of a, b and c in ax + by + c = 0 we get,

3x + 0×y – 5 = 0

(ii) 5y = 4

⇒ 5y – 4 = 0

Comparing, 5y – 4 = 0 with ax + by + c = 0 we get,

the coefficient of x i.e., a = 0 since, there is no term of x

and the coefficient of y i.e., b = 5

and clearly, c = – 4

putting the values of a, b and c in ax + by + c = 0 we get,

0×x + 5y – 4 = 0

Question: 27

The total runs sc

Solution:

Let the runs scored by the first batsman be x

And,

Let the runs scored by the second batsman be y

The total runs scored are 215 which will be the sum of runs scored by both the batsmen, i.e.,

x + y = 215

Question: 28

The weight of a b

Solution:

Let the weight of the notebook be x

And,

Let the weight of the book be y

Then, the weight of a book is three times the weight of a note book, i.e.,

y = 3×x or y = 3x

Question: 29

Check which of th

Solution:

(i) (3, 0)

2x – 3y = 6

LHS = 2x – 3y

Where x = 3 and y = 0,

Putting these values in 2x – 3y

⇒ 2×3 – 3×0

⇒ 6 – 0

⇒ 6 = RHS

Since, LHS = RHS therefore, (3, 0) satisfies 2x – 3y = 6

(ii) (0,2)

2x – 3y = 6

LHS = 2x – 3y

Where x = 0 and y = 2,

Putting these values in 2x – 3y

⇒ 2×0 – 3×2

⇒ 0 – 6

⇒ – 6 ≠ RHS

Since, LHS ≠RHS therefore, (0, 2) does not satisfy 2x – 3y = 6

(iii) (2, 6)

2x – 3y = 6

LHS = 2x – 3y

Where x = 2 and y = 6,

Putting these values in 2x – 3y

⇒ 2×2 – 3×6

⇒ 4 – 18

⇒ – 14≠ RHS

Since, LHS ≠RHS therefore, (2, 6) does not satisfy 2x – 3y = 6

(iv) (6, 2)

2x – 3y = 6

LHS = 2x – 3y

Where x = 6 and y = 2,

Putting these values in 2x – 3y

⇒ 2×6 – 3×2

⇒ 12 – 6

⇒ 6 = RHS

Since, LHS = RHS therefore, (6, 2) satisfies 2x – 3y = 6

Question: 30

Find the value of

Solution:

2x + 5y = k

Putting, x = 3 and y = 1 in 2x + 5y = k

⇒ 2×3 + 5×1 = k

⇒ 6 + 5 = k

⇒ 11 = k

Hence, k = 11

Question: 31

Find four differe

Solution:

2x + y = 6

⇒ y = 6 – 2x

To find four different solutions of the equation, we will put four different values of x.

Let them be, x = 1, x = 2, x = 3 and x = 4.

When, x = 1, then, y = 6 – 2×1

⇒ y = 6 – 2

⇒ y = 4

Therefore, (x, y) = (1, 4)

When, x = 2, then, y = 6 – 2×2

⇒ y = 6 – 4

⇒ y = 2

Therefore, (x, y) = (2, 2)

When, x = 3, then, y = 6 – 2×3

⇒ y = 6 – 6

⇒ y = 0

Therefore, (x, y) = (3, 0)

When, x = 4, then, y = 6 – 2×4

⇒ y = 6 – 8

⇒ y = – 2

Therefore, (x, y) = (4, – 2)

Hence, the solutions are (1, 4), (2, 2), (3, 0), (4, – 2)

Question: 32

Express y in term

Solution:

$\frac{x}{5} + 2y = 3$

$\Rightarrow 2y = 3 - \frac{x}{5}$

$\Rightarrow 2y = \frac{15 - x}{5}$

$\Rightarrow y = \frac{15 - x}{5 \times 2}$

$\Rightarrow y = \frac{15 - x}{10}$

$\Rightarrow y = \frac{1}{10}(15 - x)$

For point (– 5, 2), x = – 5 and y = 2. Putting these values in $y = \frac{1}{10}(15 - x)$ we get,

Now, for $R.H.S = \frac{1}{10}(15 - x)$

R.H.S $= \frac{1}{10}(15 - (-5))$

R.H.S $= \frac{1}{10}(15 + 5)$

$= \frac{20}{10}$

$= 2 = y = LHS$

Since, RHS = LHS, therefore, yes (– 5, 2) is a solution of $y = \frac{1}{10}(15 - x)$

Question: 33

Show that (3, 1)

Solution:

The equation is 3x – y = 8

For (3, 1), x = 3 and y = 1

LHS = 3×3 – 1

= 9 – 1

= 8 = RHS

Since, RHS = LHS, therefore, (3, 1) is the solution of the equation 3x – y = 8.

For (2, – 2), x = 2 and y = – 2

LHS = 3×3 – 1

= 9 – 1

= 8 = RHS

Since, RHS = LHS, therefore, (2, – 2) is the solution of the equation 3x – y = 8.

Hence, (3, 1) and (2, – 2) are the solutions of the equation 3x – y = 8.

Now to find two more solutions,

3x – y = 8

⇒ y = 3x – 8

Let x = 1, then, y = 3x – 8

⇒ y = 3×1 – 8

⇒ y = 3 – 8

⇒ y = – 5

Therefore, (1, – 5) is a solution of 3x – y = 8.

Let x = 4, then, y = 3x – 8

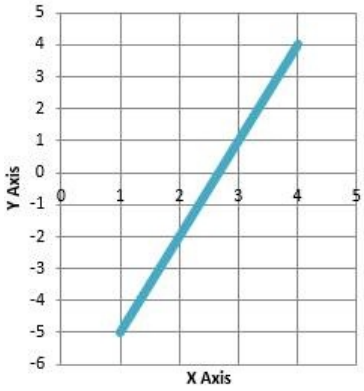
⇒ y = 3×4 – 8

⇒ y = 12 – 8

⇒ y = 4

Therefore, (4, 4) is a solution of 3x – y = 8.

Plotting the points we obtain the following graph,



The blue line in the graph is of the equation 3x – y = 8.

From the graph, it is clear that it has infinitely many solutions.

Question: 34

For the equation

Solution:

(i) Given equation, 6x – 5y = 8

For the point, (3, 2),

x = 3 and y = 2

Putting these values in, 6x – 5y = 8

LHS = 6x – 5y

= 6×3 – 5×2

= 18 – 10

= 8 = RHS

Since, LHS = RHS, therefore, (3, 2) is a solution of 6x – 5y = 8.

(ii) Given equation, 6x – 5y = 8

For the point, (2, 3),

x = 2 and y = 3

Putting these values in, 6x – 5y = 8

LHS = 6x – 5y

= 6×2 – 5×3

= 12 – 15

= – 3 ≠ RHS

Since, LHS ≠ RHS, therefore, (2, 3) is not a solution of 6x – 5y = 8.

Question: 35

If the point (3,

Solution:

Given equation: 3y = ax + 7

⇒ ax = 3y – 7

$\Rightarrow a = \frac{3y-7}{x}$

Since, the point (3, 4) lies on the graph of the equation 3y = ax + 7 therefore, it should satisfy the equation 3y = ax + 7

So, x = 3 and y = 4

Putting these values we get,

$$a = \frac{3y-7}{x}$$

$$\Rightarrow a = \frac{3\times 4-7}{3}$$

$$\Rightarrow a = \frac{12-7}{3}$$

$$\Rightarrow a = \frac{5}{3}$$

Question: 36

Find two solution

Solution:

(i) 3x + 4y = 12

⇒ 4y = 12 – 3x

$\Rightarrow y = \frac{12-3x}{4}$

Let x = 4,

$y = \frac{12-3x}{4}$

$\Rightarrow y = \frac{12-3\times4}{4}$

$\Rightarrow y = \frac{12-12}{4}$

⇒ y = 0

Therefore, (4, 0) is a solution

Let x = – 4,

$y = \frac{12-3x}{4}$

$\Rightarrow y = \frac{12-3\times-4}{4}$

$\Rightarrow y = \frac{12+12}{4}$

⇒ y = 6

Therefore, (– 4, 6) is a solution

(ii) 3x + 5y = 0

⇒ 5y = 0 – 3x

$\Rightarrow y = \frac{-3x}{5}$

Let x = 5,

$y = \frac{-3x}{5}$

$\Rightarrow y = \frac{-3\times5}{5}$

$\Rightarrow y = \frac{-15}{5}$

⇒ y = – 3

Therefore, (5, – 3) is a solution

Let x = – 5,

$y = \frac{-3x}{5}$

$\Rightarrow y = \frac{-3\times-5}{5}$

$\Rightarrow y = \frac{15}{5}$

⇒ y = 3

Therefore, (– 5, 3) is a solution

(iii) 4y + 5 = 0

⇒ 4y = 0 – 5

$\Rightarrow y = \frac{-5}{4}$

Let x = 1,

$y = \frac{-5}{4}$

Therefore, $\left(1, \frac{-5}{4}\right)$ is a solution.

Let x = – 1,

$y = \frac{-5}{4}$

Therefore, $\left(-1, \frac{-5}{4}\right)$ is a solution.

Question: 37

Study the graph g

Solution:

To find the correct answer, we will try all the options.

There are two points given,

A = (1, 3) and B = (– 1, – 1)

We will put them in all the equations and check whether they satisfy or not.

(i) y = x

When x = 1 then, y = x

⇒ y = 1 ≠ 3

So it does not satisfy y = x

Therefore, the graph does not satisfy y = x

(ii) y = 2x

When x = 1 then, y = 2x

⇒ y = 2 × 1

⇒ y = 2 ≠ 3

So it does not satisfy y = 2x

Therefore, the graph does not satisfy y = 2x

(iii) y = 2x + 1

When x = 1 then, y = 2x + 1

⇒ y = 2 × 1 + 1

⇒ y = 2 + 1

⇒ y = 3

So it satisfies y = 2x

Now When x = – 1 then, y = 2x + 1

⇒ y = 2 × – 1 + 1

⇒ y = – 2 + 1

⇒ y = – 1

So it also satisfies y = 2x

Therefore, the graph satisfies y = 2x + 1

(iv) x + y = 0

When x = 1 then, y = – x

⇒ y = – 1 ≠ 3

So it does not satisfy x + y = 0

Therefore, the graph does not satisfy x + y = 0

Question: 38

Draw the graph of

Solution:

3x + 5y – 15 = 0

⇒ 5y = 15 – 3x

$\Rightarrow y = \frac{15-3x}{5}$

When, x = 0 then,

$y = \frac{15-3x}{5}$

$\Rightarrow y = \frac{15-3\times0}{5}$

$\Rightarrow y = \frac{15-0}{5}$

$\Rightarrow y = \frac{15}{5}$

⇒ y = 3

When, x = 5 then,

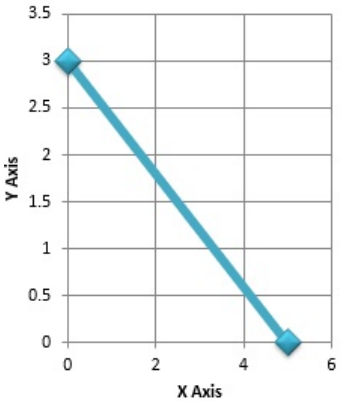
$y = \frac{15-3x}{5}$

$\Rightarrow y = \frac{15-3\times5}{5}$

$\Rightarrow y = \frac{15-15}{5}$

⇒ y = 0

Plotting (0, 3) and (5, 0) we get the following graph,



The blue line indicates the required graph of 3x + 5y – 15 = 0

Now, to show that (1, 2) is not the solution of

3x + 5y – 15 = 0

We put x = 1 and y = 2 in $y = \frac{15-3x}{5}$

$RHS = \frac{15-3x}{5}$

$= \frac{15-3\times1}{5}$

$= \frac{15-3}{5}$

$= \frac{12}{5} \neq 2 = \text{RHS}$

Since, LHS ≠ RHS therefore, x = 1, y = 2 is not a solution 3x + 5y – 15 = 0.

Question: 39

Draw the graph of

Solution:

3x + 2y = 12

⇒ 3x + 2y = 12

⇒ 2y = 12 – 3x

$\Rightarrow y = \frac{12-3x}{2}$

When, x = 0 then,

$y = \frac{12-3x}{2}$

$\Rightarrow y = \frac{12-3\times0}{2}$

$\Rightarrow y = \frac{12-0}{2}$

$\Rightarrow y = \frac{12}{2}$

⇒ y = 6

When, x = 4 then,

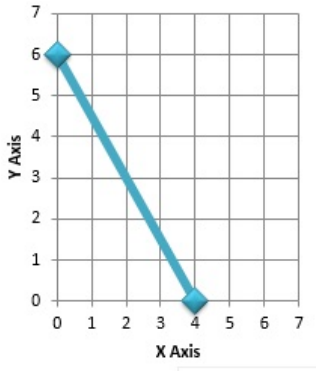
$y = \frac{12-3x}{2}$

$\Rightarrow y = \frac{12-3\times4}{2}$

$\Rightarrow y = \frac{12-12}{2}$

⇒ y = 0

On plotting, (0, 6) and (4, 0) we get the following graph,



The blue line indicates the required graph of 3x + 2y = 12

It can be clearly seen from the graph, that it cuts the x axis at (4, 0) and y axis at (0, 6)

Question: 40

Draw the graph of

Solution:

Given equation,

x – 2y = 6

⇒ – 2y = 6 – x

$$\Rightarrow y = -\frac{6-x}{2}$$

$$\Rightarrow y = \frac{x-6}{2}$$

For point, P (2, – 2), x = 2 and y = – 2

$$RHS = \frac{x-6}{2}$$

$$= \frac{2-6}{2}$$

$$= \frac{-4}{2}$$

= – 2 = LHS

Since, RHS = LHS, therefore, (2, – 2) satisfies x – 2y = 6

For point, Q (4, – 1), x = 4 and y = – 1

$$RHS = \frac{x-6}{2}$$

$$= \frac{4-6}{2}$$

$$= \frac{-2}{2}$$

= – 1 = LHS

Since, RHS = LHS, therefore, (4, – 1) satisfies x – 2y = 6

For point, Q (– 2, – 4), x = – 2 and y = – 4

$$RHS = \frac{x-6}{2}$$

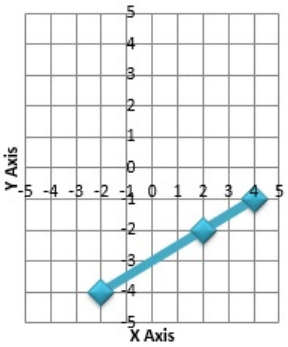
$$= \frac{-2-6}{2}$$

$$= \frac{-8}{2}$$

= – 4 = LHS

Since, RHS = LHS, therefore, (– 2, – 4) satisfies x – 2y = 6

On plotting, P (2, – 2), Q (4, – 1), and R (– 2, – 4) we get the following graph,



The blue line indicates the required graph of x – 2y = 6

It can be clearly seen from the graph, that the points P (2, – 2), Q (4, – 1), and R (– 2, – 4) lies on the straight line

Question: 41

There are two sca

Solution:

(i) Given equation,

$F = \frac{9}{5}C + 32$

Let $C = 0°$, then,

$F = \frac{9}{5}C + 32$

$\Rightarrow F = \frac{9}{5} \times 0 + 32$

$\Rightarrow F = 0 + 32$

$\Rightarrow F = 32°$

Let $C = 10°$, then,

$F = \frac{9}{5}C + 32$

$\Rightarrow F = \frac{9}{5} \times 10 + 32$

$\Rightarrow F = 18 + 32$

$\Rightarrow F = 50°$

Let $C = 20°$, then,

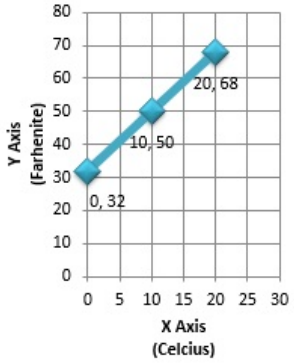
$F = \frac{9}{5}C + 32$

$\Rightarrow F = \frac{9}{5} \times 20 + 32$

$\Rightarrow F = 36 + 32$

$\Rightarrow F = 68°$

On plotting, (0, 32), (10, 50) and (20, 68) we get the following graph,



The blue line indicates the required graph of $F = \frac{9}{5}C + 32$

(ii) When, $C = 0°$, then,

$F = \frac{9}{5}C + 32$

$\Rightarrow F = \frac{9}{5} \times 0 + 32$

$\Rightarrow F = 0 + 32$

$\Rightarrow F = 32°$

(iii) When $F = 95°$, then

$F = \frac{9}{5}C + 32$

$\Rightarrow 95 = \frac{9}{5} \times C + 32$

$\Rightarrow 95 - 32 = \frac{9}{5} \times C$

$\Rightarrow 63 = \frac{9}{5} \times C$

$\Rightarrow C = \frac{63 \times 5}{9}$

$\Rightarrow C = 35°$

(iv) When $F = 0°$, then

$F = \frac{9}{5}C + 32$

$\Rightarrow 0 = \frac{9}{5} \times C + 32$

$\Rightarrow 0 - 32 = \frac{9}{5} \times C$

$\Rightarrow -32 = \frac{9}{5} \times C$

$\Rightarrow C = \frac{-32 \times 5}{9}$

$\Rightarrow C = 17.7°$

(v) Put C = F, then

$F = \frac{9}{5}C + 32$

$\Rightarrow F = \frac{9}{5} \times F + 32$

$\Rightarrow F - \frac{9}{5} \times F = 32$

$\Rightarrow \frac{5F-9F}{5} = 32$

$\Rightarrow F = -\frac{32\times5}{4}$

$\Rightarrow F = -\frac{160}{4}$

⇒ F = – 40° = C

Therefore, – 40°F = – 40°C

Question: 42

A taxi charges Rs

Solution:

Total distance covered = x km

Total fare = Rs y

Charges for 1 km = Rs 20

Charges for 2 kms = Rs 20 + Rs 12

Charges for 3 kms = Rs 20 + Rs 12 × 2

Continuing, we get,

Charges for (x – 1) kms = Rs 20 + Rs 12 × (x – 2)

Charges for x kms = Rs 20 + Rs 12 × (x – 1)

Total fare = Rs y

Therefore,

Total fare = Charges for x kms

⇒ y = 20 + 12 × (x – 1)

⇒ y = 20 + 12x – 12

⇒ y = 12x + 8

Let x = 1 then, y = 12x + 8

⇒ y = 12× 1 + 8

⇒ y = 12 + 8

⇒ y = 20

Let x = 5 then, y = 12x + 8

⇒ y = 12× 5 + 8

⇒ y = 60 + 8

⇒ y = 68

Let x = 10 then, y = 12x + 8

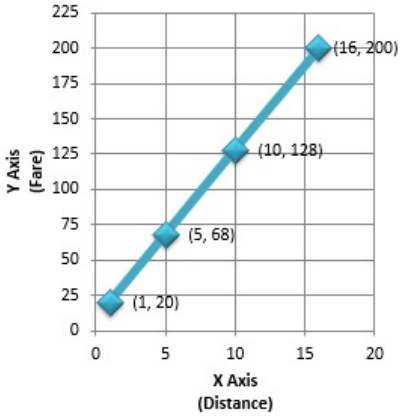
⇒ y = 12× 10 + 8

⇒ y = 120 + 8

⇒ y = 128

Plotting, (1, 20), (5, 68) and (10, 128) on the graph we get,

The blue line indicates the required graph of y = 12x + 8



When x = 16, we take 16 on x axis.

Draw a line from 16 on x axis which is parallel to y axis and meets the blue line.

Clearly from the graph the value at y axis is 200

Therefore, taxi charges at covering 16 km = Rs 200

Question: 43

If the work done

Solution:

Work done = W

Force = F = 4

Distance = d

Since, Work done ∝ Distance

Therefore, W ∝ d

⇒ W = F× d

⇒ W = 4d

Let d = 0

⇒ W = 4 × 0 = 0

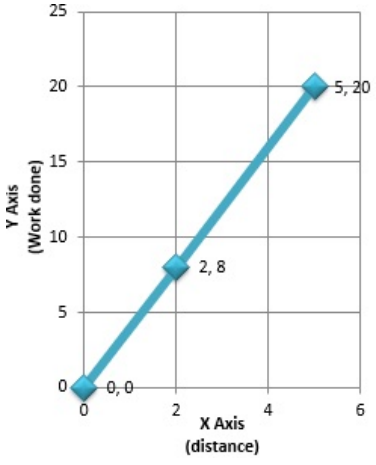
Let d = 2

⇒ W = 4 × 2 = 8

Let d = 5

⇒ W = 4 × 5 = 20

Plotting them we get the following graph,



The blue line indicates the required graph of W = 4d

Clearly from the graph,

(i) When d = 2 units

then, W = 8 units

(ii) When d = 0 unit

then, W = 0 unit

(iii) When d = 5 units

then, W = 20 units

Exercise : FORMATIVE ASSESSMENT (UNIT TEST)

Question: 1

For the equation

Solution:

Given equation, 5x + 8y = 50

Put y = 10 in 5x + 8y = 50

⇒ 5x + 8× 10 = 50

⇒ 5x + 80 = 50

⇒ 5x = 50 – 80

⇒ 5x = – 30

$\Rightarrow x = -\frac{30}{5}$

$\Rightarrow x = -6$

Question: 2

The linear equati

Solution:

Given equation,

2x + 5y = 16

⇒ 5y = 16 – 2x

$\Rightarrow y = \frac{16-2x}{5}$

When x = – 2

$\Rightarrow y = \frac{16-2\times(-2)}{5}$

$\Rightarrow y = \frac{16-(-4)}{5}$

$\Rightarrow y = \frac{20}{5}$

$\Rightarrow y = 4$

When x = 8

$\Rightarrow y = \frac{16-2\times8}{5}$

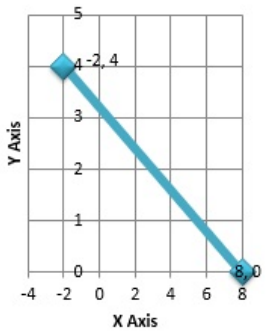
$\Rightarrow y = \frac{16-16}{5}$

⇒ y = 0

Thus we have the following table,

X	– 2	0
Y	4	8

Plotting (– 2, 4) and (8, 0) we get the following graph,



The blue line is the equation of 2x + 5y = 16

Clearly, from the graph we get infinitely many solutions.

Question: 3

Express

Solution:

Given equation,

$\frac{2x}{3} + \frac{y}{6} - 5 = 0$

Taking LCM,

$\frac{4x+y-30}{6} = 0$

⇒ 4x + y – 30 = 0×6

⇒ 4x + y – 30 = 0

Question: 4

If 5y – 3x + 15 =

Solution:

Given equation,

5y – 3x + 15 = 0

⇒ 5y – 3x + 15 = 0

⇒ 5y = 3x – 15

$\Rightarrow y = \frac{3x-15}{5}$

Question: 5

For what value of

Solution:

Given equation, 3x – y = 6

For the point, (k, – 3), x = k and y = – 3

Put the values of x and y in $3x - y = 6$

⇒ 3k – (– 3) = 6

⇒ 3k + 3 = 6

⇒ 3k = 6 – 3

⇒ 3k = 3

⇒ $k = \frac{3}{3}$

⇒ k = 1

Question: 6

If x = 3, y = – 2

Solution:

Given equation, 2x – 3y = k

For the point, (3, – 2), x = 3 and y = – 2

Put the values of x and y in 2x – 3y = k

⇒ 2×3 – 3×(– 2) = k

⇒ 6 –(– 6) = k

⇒ 6 + 6 = k

⇒ k = 12

Question: 7

Find the points w

Solution:

Given equation, 3x + 4y = 12

⇒ 4y = 12 – 3x

⇒ $y = \frac{12-3x}{4}$

When x = – 4, then,

$$y = \frac{12 - 3x}{4}$$

$$\Rightarrow y = \frac{12 - 3 \times (-4)}{4}$$

$$\Rightarrow y = \frac{12 - (-12)}{4}$$

$$\Rightarrow y = \frac{12 + 12}{4}$$

⇒ $y = \frac{24}{4}$

⇒ y = 6

When x = 0, then,

$$y = \frac{12 - 3x}{4}$$

$$\Rightarrow y = \frac{12 - 3 \times 0}{4}$$

$$\Rightarrow y = \frac{12 - 0}{4}$$

$$\Rightarrow y = \frac{12}{4}$$

⇒ y = 3

When x = 4, then,

$$y = \frac{12 - 3x}{4}$$

$$\Rightarrow y = \frac{12 - 3 \times 4}{4}$$

$$\Rightarrow y = \frac{12 - 12}{4}$$

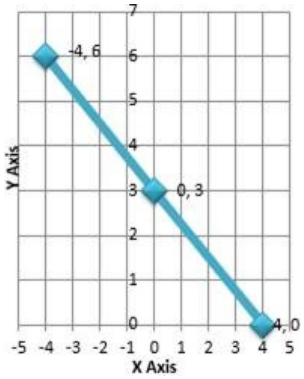
$$\Rightarrow y = \frac{12 - 12}{4}$$

⇒ y = 0

Thus we have the following table,

X	– 4	0	4
Y	6	3	0

On plotting the points, (– 4, 6), (0, 3) and (4, 0) we get the following graph,



Clearly from the graph, it cuts x axis at (4, 0) and y axis at (0, 3)

Question: 8

The area of the t

Solution:

Given equation,

x + 3y = 12

⇒ 3y = 12 – x

$$\Rightarrow y = \frac{12 - x}{3}$$

When x = 0, then,

$y = \frac{12-x}{3}$

$\Rightarrow y = \frac{12-0}{3}$

$\Rightarrow y = \frac{12}{3}$

$\Rightarrow$ y = 4

When x = 6, then,

$y = \frac{12-6}{3}$

$\Rightarrow y = \frac{12-6}{3}$

$\Rightarrow y = \frac{6}{3}$

$\Rightarrow$ y = 2

When x = 12, then,

$y = \frac{12-12}{3}$

$\Rightarrow y = \frac{12-12}{3}$

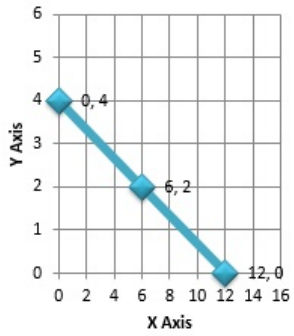
$\Rightarrow$ y = 0

Thus we have the following table,

X	0	6	12
Y	4	2	0

Now on plotting (0, 4), (6, 2) and (12, 0) we have the following graph,

Clearly from the graph,



Base of triangle = 12 – 0 = 12 units

Height of triangle = 4 – 0 = 4 units

We know that, Area of triangle =

$\frac{1}{2} \times$ base $\times$ height

$= \frac{1}{2} \times$ 12 units $\times$ 4 units

$= \frac{48}{2}$ sq. units

= 24 sq. units

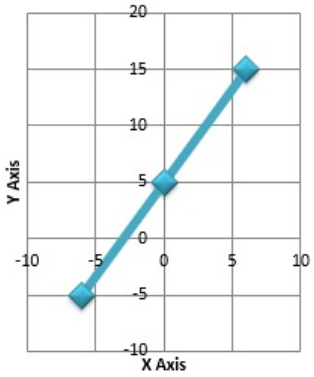
Therefore, the area of the triangle is 24 sq. units

Question: 9

The question cons

Solution:

We know that the equation of x-axis is y = 0 and the equation of any line parallel to x-axis is y = k, therefore, the reason is true.



For, y = mx

If we put x = 0 then, y = m×0 = 0 therefore, we get (0, 0) which is origin. So, y = mx represents a line passing through the origin, therefore, the assertion is true.

The blue line is the graph of y = mx which clearly, passes through origin.

Hence, both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).

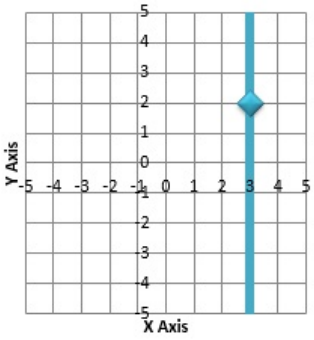
Question: 10

The question cons

Solution:

We know that the equation of y-axis is x = 0 and the equation of any line parallel to y axis is x = a, therefore, the reason is true.

Also, by the reason x = 3 is a line parallel to y-axis, therefore, the assertion is true.



Hence, both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).

Question: 11

Match the followi

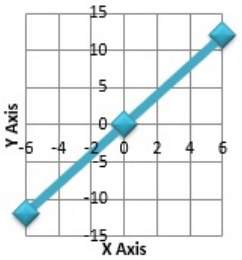
Solution:

(a) – (s), (b) – (r), (c) – (q), (d) – (p)

Column I	Column II
A. Any line parallel to x-axis is	(s) y = k
B. Any line parallel to y-axis is	(r) x = k
C. Any line passing through the origin is	(q) y = mx
D. If the point (– 2, 2) lies on the line ax + 4y = 2, then a =	(p) 3

A. We know that the equation of x-axis is y = 0 and the equation of any line parallel to x axis is y = k, where k is any constant.

B. We know that the equation of y-axis is x = 0 and the equation of any line parallel to y axis is x = k, where k is any constant.



C. For, y = mx

If we put x = 0 then, y = m×0 = 0 therefore, we get (0, 0) which is origin. So, y = mx represents a line passing through the origin.

The blue line is the graph of y = mx which clearly, passes through origin.

D. Given equation, ax + 4y = 2

⇒ ax = 2 – 4y

$\Rightarrow a = \frac{2-4y}{x}$

Point (– 2,2) i.e, x = – 2 and y = 2

$\Rightarrow a = \frac{2-4\times2}{-2}$

$\Rightarrow a = \frac{2-8}{-2}$

$\Rightarrow a = \frac{-6}{-2}$

⇒ a = 3

Question: 12

Give the geometri

Solution:

(i) In one variable it will only be in the terms of x,

Therefore, the geometrical representation in one variable is x = 3

(ii) In two variables it will be in the terms of x and y,

Since, there is no term of y so the coefficient of y will be 0

Therefore, the geometrical representation in two variables is x + 0 × y = 3

Question: 13

For the line 2x +

Solution:

Given equation, 2x + 3y = 6

(i) x – intercept lies on the x-axis, therefore, y = 0,

Put y = 0 in 2x + 3y = 6

⇒ 2x + 3× 0 = 6

⇒ 2x + 0 = 6

⇒ 2x = 6

$\Rightarrow x = \frac{6}{2}$

⇒ x = 3

Therefore, x – intercept = 3

(ii) y – intercept lies on the y-axis, therefore, x = 0,

Put x = 0 in 2x + 3y = 6

⇒ 2×0 + 3y = 6

⇒ 0 + 3y = 6

⇒ 3y = 6

$\Rightarrow x = \frac{6}{3}$

⇒ x = 2

Therefore, y – intercept = 2

Question: 14

Draw the graph of

Solution:

When x = – 4 then, y = x

⇒ y = – 4

When x = – 2 then, y = x

⇒ y = – 2

When x = 0 then, y = x

⇒ y = 0

When x = 2 then, y = x

⇒ y = 2

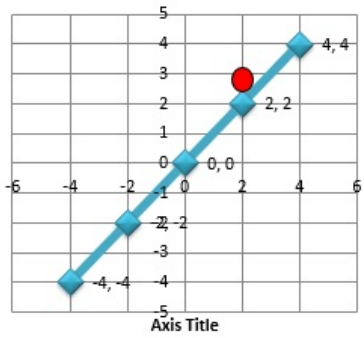
When x = 4 then, y = x

⇒ y = 4

Thus we have the following table,

X	– 4	– 2	0	2	4
Y	– 4	– 2	0	2	4

On plotting we get the following graph,



Clearly from the graph, (2,3) does not lie on the line y = x

Question: 15

Draw the graph of

Solution:

Given equation, 2x – 3y = 4

⇒ 3y = 2x – 4

$\Rightarrow y = \frac{2x-4}{3}$

When x = – 4, then,

$y = \frac{2x-4}{3}$

$\Rightarrow y = \frac{2\times(-4)-4}{3}$

$\Rightarrow y = \frac{-8-4}{3}$

$\Rightarrow y = \frac{-12}{3}$

⇒ y = – 4

When x = – 1, then,

$y = \frac{2x-4}{3}$

$\Rightarrow y = \frac{2\times(-1)-4}{3}$

$\Rightarrow y = \frac{-2-4}{3}$

$\Rightarrow y = \frac{-6}{3}$

⇒ y = – 2

When x = 2, then,

$$y = \frac{2x-4}{3}$$

$$\Rightarrow y = \frac{2\times 2-4}{3}$$

$$\Rightarrow y = \frac{4-4}{3}$$

⇒ y = 0

When x = 5, then,

$$y = \frac{2x-4}{3}$$

$$\Rightarrow y = \frac{2\times 5-4}{3}$$

$$\Rightarrow y = \frac{10-4}{3}$$

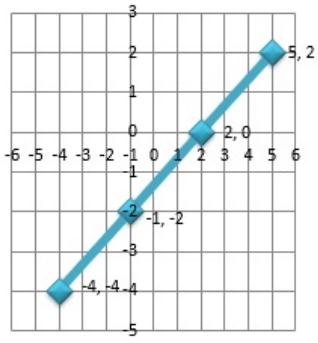
$$\Rightarrow y = \frac{6}{3}$$

⇒ y = 2

Thus we have the following table,

X	– 4	– 1	2	5
Y	– 4	– 2	0	2

On plotting these points we have the following graph,



Clearly, from the graph (– 1, – 2) is the solution of the line 2x – 3y = 4

Question: 16

The runs scored b

Solution:

Let the runs scored by the first batsman be x

And,

Let the runs scored by the second batsman be y

The total runs scored are 164 which will be the sum of runs scored by both the batsmen, i.e.,

x + y = 164

Let x = 100 then, x + y = 164

⇒ 100 + y = 164

⇒ y = 164 – 100

⇒ y = 64

Therefore, (100, 64) is a solution of x + y = 164

Question: 17

Find whether the

Solution:

(i) Given equation, 5x – 3y = 1

Putting x = 2 and y = 3 in 5x – 3y = 1

LHS = 5x – 3y

= 5× 2 – 3× 3

= 10 – 9

= 1 = RHS

Therefore, the statement is true

(ii) Given equation, y = 2x + 5

Putting x = 1 and y = 5 in y = 2x + 5

⇒ y = 2× 1 + 5

⇒ y = 2 + 5

⇒ y = 7 ≠ 5

Therefore, the statement is false

(iii) Given equation,

x + y = 6

⇒ y = 6 – x

When x = 0, then,

y = 6 – x

⇒ y = 6 – 0

⇒ y = 6

When x = 3, then,

y = 6 – x

⇒ y = 6 – 3

⇒ y = 3

When x = 6, then,

y = 6 – x

⇒ y = 6 – 6

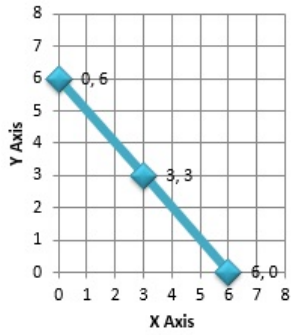
⇒ y = 0

Thus we have the following table,

X	0	3	6
Y	6	3	0

Now on plotting (0, 6), (3, 2) and (6, 0) we have the following graph,

Clearly from the graph,



Base of triangle = 6 – 0 = 6 units

Height of triangle = 6 – 0 = 6 units

We know that, Area of triangle =

$$\frac{1}{2} \times \text{ base } \times \text{ height}$$

$$= \frac{1}{2} \times 6 \text{ units} \times 6 \text{ units}$$

$$= \frac{36}{2} \text{ sq. units}$$

= 18 sq. units

Therefore, the area of the triangle is 18 sq. units

Therefore, the statement is true

Question: 18

Two men start fro

Solution:

Distance between the two men = 42 km

Speed of man at point A = 4 km/hr

Speed of man at point B = 4 km/hr (say)

Time = 6 hrs

$$\text{Relative speed } = \frac{\text{Distance}}{\text{Time}}$$

$$\Rightarrow \text{ Relative speed } = \frac{42 \text{ km}}{6 \text{ hrs}}$$

⇒ Relative speed = 7 km/hrs

Speed of man at point B = Relative speed – Speed of man at point A

= 7 km/hrs – 4 km/hr

= 3 km/hrs

Therefore, speed of second man is 3 km/hrs

Question: 19

The taxi fare in

Solution:

Fixed amount = Rs 50

Charges for 1 km = Rs 16

Charges for 2 km = Rs 16 × 2 = Rs 32

Charges for x km = Rs 16 × x = Rs 16x

Total fare = y = Fixed amount + Charges for x km

= Rs 50 + Rs 16x

Therefore, the linear equation is, y = 50 + 16x

Now, to find the total fare for 20 kms, put x = 20 in y = 50 + 16x

⇒ y = 50 + 16 × 20

⇒ y = 50 + 320

⇒ y = 370

Therefore, the total fare for 20 km is Rs 370

Question: 20

Draw the graph fo

Solution:

Given equation, x + y = 6

⇒ y = 6 – x

When x = 0, then y = 6 – x

⇒ y = 6 – 0

⇒ y = 6

When x = 2, then y = 6 – x

⇒ y = 6 – 2

⇒ y = 4

When x = 4, then y = 6 – x

⇒ y = 6 – 4

⇒ y = 2

When x = 6, then y = 6 – x

⇒ y = 6 – 6

⇒ y = 0

Thus we have the following table,

X	0	2	4	6
Y	6	4	2	0

Given equation, x – y = 2

⇒ y = x – 2

When x = 0, then y = x – 2

⇒ y = 0 – 2

⇒ y = – 2

When x = 2, then y = x – 2

⇒ y = 2 – 2

⇒ y = 0

When x = 4, then y = x – 2

⇒ y = 4 – 2

⇒ y = 2

When x = 6, then y = 6 – 2

⇒ y = 6 – 2

⇒ y = 4

Thus we have the following table,

X	0	2	4	6
Y	– 2	0	2	4

From the graph, it is clear that x + y = 6 and x – y = 2 intersects at (4, 2)